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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,693	12/02/2003	Toshihiro Hayami	246076US2SP	1975
22850	7590	10/19/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			KACKAR, RAM N	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/724,693

Applicant(s)

HAYAMI ET AL.

Examiner

Ram N. Kackar

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/2/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-4, 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants admitted prior art (AAPA) in view of Sugihara et al (JP 03072624) and further in view of Craig A. Phelps (US 5724234).**

AAPA discloses a method of temperature measurement of a susceptor disposed in a conductive vessel set to ground potential and having a space formed therein in which a plasma is generated by application of a radio frequency power which in recent years have gone in frequency to 40 MHz, 60 MHz or 100 Mhz.

AAPA do not disclose the measurement of power of the susceptor by a radiation thermometer using infrared rays.

Sugihara et al disclose temperature measurement of a sample in a grounded chamber (Fig 2 and Fig 4) for treatment of a semiconductor substrate by an infrared thermometer (16) looking through an opening (15) in the chamber wall at the rear of the sample through a recess (19). Sugihara et al teach that accurate measurement is possible by this technique.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to use infrared thermometer for its accurate and reliable measurement of temperature.

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AAPA as modified by Sugihara et al do not disclose any limitation on the size of the opening. However it would obvious that an opening made in the AAPA to allow an infrared radiation to pass also allows the possibility of RF leak.

Craig A. Phelps teaches that RF power leaks through openings of a size greater than the wavelength of the radio frequency and the leakage decreases linearly as the size of the opening decreases (Col 1 lines 60- Col 2 line 8). Craig A. Phelps further teach that the opening should be less than  $1/20$  of the wavelength.

It would be obvious therefore that at higher frequency the leak of an opening would increase and therefore at higher frequency smaller and smaller opening (less than  $1/50$  of the wavelength) will be preferable to prevent RF leak.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to use opening of as small a size as feasible in order to prevent RF leak through the opening.

**3. Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants admitted prior art (AAPA) in view of Sugihara et al (JP 03072624) and Craig a. Phelps (US 5724234) as applied to claims 1-4, 6-9 and further in view of Shimamura et al (US 5707500) as evidenced by (Article in Publication, Sensors handbook by Sabrie Soloman -Copy right 1999).**

Applicants admitted prior art (AAPA) in view of Sugihara et al and Craig A. Phelps is discussed above.

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(AAPA) as modified by Sugihara et al and Craig A. Phelps do not disclose that the measuring portion of the susceptor is structured as a blackbody.

It is however known in the art through basic understanding of radiation thermometry that the infrared radiation energy emitted from heated surface is proportional to the emissivity of the surface and to  $T^4$  where T is the temperature. Since emissivity of a black body is 1 it is obvious that signal for temperature measurement will have a better signal/noise ratio for a black body (See Article 84 specially 84.4).

Same teaching is echoed by Shimamura et al (Col 19 lines 34 to Col 20 line 65) who teach the use of making the inside of shielding cylinder as blackbody to reduce stray light (black body absorbs and does not reflect light).

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to use the surfaces being looked at by radiation thermometer to be a blackbody in order to have high signal/noise ratio.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. JP 2001-093882 to Tamagawa et al discloses a grounded chamber for semiconductor processing and discloses temperature measurement using infrared.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ram Kackar  
Examiner AU 1763